BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO. 2018-319-E

In the Matter of:	)	
	)	**DIRECT TESTIMONY OF**
Application of Duke Energy Carolinas, LLC	)	**DONALD SCHNEIDER JR.**
for Adjustments in Electric Rate Schedules	)	**FOR DUKE ENERGY**
and Tariffs	)	**CAROLINAS, LLC**
	)	

I. INTRODUCTION AND SUMMARY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Donald L. Schneider Jr., and my business address is 400 South Tryon Street, Charlotte, North Carolina 28202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Duke Energy Business Services, LLC ("DEBS"), as General Manager, Advanced Metering Infrastructure ("AMI") Program Management. DEBS provides various administrative and other services to Duke Energy Carolinas, LLC ("DE Carolinas" or the "Company") and other affiliated companies of Duke Energy Corporation ("Duke Energy").

Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AS GENERAL MANAGER, AMI PROGRAM MANAGEMENT, FOR DUKE ENERGY.

A. My duties and responsibilities include managing the project execution of all AMI or "smart meter" related projects for all Duke Energy jurisdictions, including DE Carolinas. I am also responsible for reporting and mapping related to AMI, as well as system integrations and upgrades involved in the control of AMI communication networks and management of AMI data.

Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL QUALIFICATIONS.

A. I received a Bachelor of Science Degree in Electrical Engineering from the University of Evansville (Indiana) in 1986. Upon graduation, I was employed by Duke Energy Indiana (then known as Public Service Indiana) as an

electrical engineer. Throughout my career with Duke Energy, I have held various positions of increasing responsibility in the areas of engineering and operations, including distribution planning, distribution design, field operations, and capital budgets. In 2006, I was named General Manager, Midwest Premise Services, responsible for managing all of Duke Energy's Midwest premise service and meter reading departments. Following this, in 2008, prior to the Duke Energy/Progress Energy merger, I was promoted to a position responsible for managing the project execution for all Grid Modernization projects in the field, including both AMI and Distribution Automation devices, for all legacy Duke Energy jurisdictions. In 2012, following the Duke Energy/Progress Energy merger, I was named to my current position. Additionally, I have been registered as a professional engineer with the State Board of Registration for Professional Engineers in the state of Indiana since 1995.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION OR ANY OTHER REGULATORY BODIES?

A. I have not testified before this Commission; however, I have testified for DE Carolinas and Duke Energy Progress in North Carolina before the North Carolina Utilities Commission; for Duke Energy Ohio before the Public Utilities Commission of Ohio; for Duke Energy Kentucky before the Kentucky Public Service Commission; and, for Duke Energy Indiana before

the Indiana Utility Regulatory Commission in cases related to AMI and smart grid topics.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to describe the Company's progress in deploying AMI technology across its South Carolina service territory. I also highlight some of the benefits to customers of the AMI technology by providing them with greater convenience, control and transparency.

II. AMI IMPLEMENTATION

Q. WHAT IS AMI?

A. AMI is the term used to refer to a comprehensive metering solution – including meters, communication devices, communication networks, and back office systems – used to create two-way communications between customer meters and the utility. It is an overall metering solution, as opposed to just a new type of meter, that allows for remote meter reading, which eliminates walk-by and/or drive-by meter reading. An AMI system consists of an advanced meter, a Field Area Network ("FAN"), and back-office systems that manage and maintain data collected from the meters. AMI meters - often referred to as smart meters - are digital electricity meters that have advanced features and capabilities beyond traditional electricity meters. Some of the advanced features include the capability for two-way communications, interval usage measurement, tamper detection, voltage and reactive power measurement, and net metering capability. Duke Energy's standard AMI

system utilizes a radio frequency ("RF") mesh architecture for the FAN, which is flexible in that the meters within the mesh network establish an optimized RF communication path to a collection point either through other meters or, in some cases, through network range extenders.

AMI allows customers access to more detailed usage information (down to the hour) via the Duke Energy online customer portal. Regular meter reads and off-cycle meter reads (for the purpose of transferring service) can be performed remotely for customers, eliminating the need for a technician to come to the customer's premise. Additionally, service connections and disconnections can be performed remotely for the majority of customers who are starting and/or stopping service, again, eliminating the need for a technician to come to the customer's premise. During storm outages, damage assessment and repair verification can be done much more quickly when customers have a smart meter.

Q. IS AMI TECHNOLOGY NEW TO THE STATE OF SOUTH CAROLINA?

A. No. As noted in Appendix J of the 2016 South Carolina State Energy Plan[1], AMI technology is not new to South Carolina. By 2016, each of the utility companies in the state had installed at least some AMI meters, and South Carolina's electric cooperatives already had a 92 percent penetration of AMI metering by then.

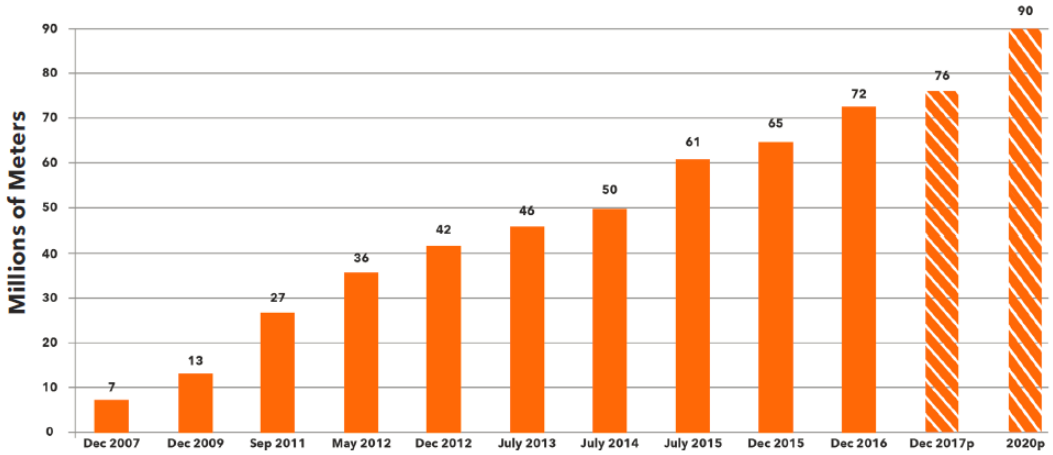
[1] Office of Regulatory Staff, South Carolina Energy Plan (2016)

Smart Meter Penetration in South Carolina						
Utility	Total Number of Meters	Manually Read Meters	AMR Meters	AMI Meters	Number of Meters Time of Use Rate Ready	Number of Meters Implementing Time of Use Rate
SC Electric Cooperatives	756,137	-	58,412	697,726	477,402	54,035
Duke Energy Carolinas	587,976	8,806	485,119	94,051	94,051	5,609
Duke Energy Progress	172,549	2,988	161,337	8,224	8,224	4,977
Santee Cooper	172,362	57,991	114,014	357	66	66
SCE&G	696,410	178	686,058	10,174	10,174	1,341
Municipalities	172,749	45,298	82,260	44,813	39,202	27,163
Total	2,558,183	115,261	1,587,200	855,345	629,119	93,191

According to research by the Edison Foundation[2], smart meter installations have been growing dramatically since 2007. The figure below projects smart meter deployment will reach 90 million by 2020.

As shown in Figure 1, smart meter installations have grown dramatically since 2007. As of year-end 2016, electric companies had installed 72 million smart meters, covering more than 55 percent of U.S. households. Based on survey results and approved plans, estimated deployments are expected to reach 76 million smart meters by the end of 2017 (covering 60 percent of U.S. households) and 90 million by 2020.

Figure 1: U.S. Smart Meter Installations Approach 76 Million; Projected to Reach 90 Million by 2020



[2] Adam Cooper, Electric Company Smart Meter Deployments: Foundation for a Smart Grid (Dec. 2017)

Q. PLEASE DESCRIBE THE IMPLEMENTATION OF AMI ACROSS THE DE CAROLINAS SOUTH CAROLINA SYSTEM.

A. DE Carolinas had approximately 95,000 smart meters installed in South Carolina before beginning its full deployment in 2016. As of September 30, 2018, DE Carolinas installed approximately 590,000 smart meters in its South Carolina service territory and deployment is essentially complete. As described below, the Company has begun to offer new customer services and programs enabled by the AMI meter.

Q. IS THERE AN ALTERNATIVE SOLUTION FOR CUSTOMERS WHO DO NOT WISH TO HAVE A SMART METER?

A. Yes. The Commission approved Rider MRM, Manually Read Meter Rider, on November 17, 2016 (hereinafter the "Opt-Out Program"), which addresses the customers who have objected to the installation of a smart meter. The Company began enrolling customers in the opt-out program in November 2017, after the completion of necessary IT system changes. DE Carolinas has been reaching out to the customers who objected to AMI meter installation, and has enrolled 417 customers in the opt-out program through the end of September 2018.

Q. ARE COSTS FOR THE AMI IMPLEMENTATION INCLUDED IN THIS RATE CASE?

A. Yes. The Company is seeking recovery of the financial effects of the depreciation of AMI meter deployment, the carrying costs on the investment, and the carrying costs on the deferred costs, which were deferred into a regulatory asset account approved by this Commission, in Docket No. 2016-240-E[3], and discussed in detail in Witness Smith's testimony.

III. AMI BENEFITS TO CUSTOMERS

Q. HOW WILL THE AMI IMPLEMENTATION DIRECTLY BENEFIT THE COMPANY'S CUSTOMERS?

A. The AMI technology is customer-focused; it enables greater convenience, control and transparency over a customer's energy consumption. Customers with smart meters have access to detailed information about their hourly and daily usage patterns through the Duke Energy online customer portal so they can make more informed choices regarding how they use energy. With the capability to record interval usage data, smart meters are a foundational technology that can enable new rate designs, as referenced in Witness Pirro's testimony. Likewise, this additional data, combined with the new Customer Connect System, referenced in Witness Hunsicker's testimony, will lead to

[3] *Petition of Duke Energy Carolinas, LLC for an Accounting Order to Defer Certain Costs Related to Advanced Metering Infrastructure (AMI)*, Docket No. 2016-240-E, Order No. 2016-489 (July 12, 2016).

expanded options and flexibility in supporting enhanced customer services and programs.

All customers receiving smart meters will benefit from the greater convenience that enables DE Carolinas to perform regular meter reads and off-cycle meter reads remotely. Additionally, with the remote disconnect and reconnect capability of AMI meters, customers who become eligible for disconnection for non-payment will have power restored more quickly through the remote reconnect capability, than they would if DE Carolinas had to send a technician on site.

Finally, smart meters will be integrated into Company efforts to increase communications with customers about outages and restoration timelines. DE Carolinas will have the capability to interrogate individual smart meters or masses of smart meters to determine if customers have power. During the damage assessment phase of a storm, the mass meter interrogation capability allows the Company to have a better view of where outages are located on the system. This functionality helps reduce the assessment time, thus reducing outage durations for customers. During the power restoration phase of a storm, the capability of mass meter interrogation enables the Company to determine whether power has been restored to each meter before leaving an area. For example, before the AMI deployment, if the Company restored power to a circuit that was experiencing an outage, DE Carolinas did not know whether each individual home had been restored along that circuit.

It could happen that power is restored to nearly all of the homes along the circuit, but that one or two homes continue to be without service due to some other individual issue. The Company formerly had no way of knowing if this has occurred until the customer notifies DE Carolinas that they are still without service, and by that time, the Company's crew may have moved on to a new area. Smart meters allow the Company to know whether individual customers are back in service before the Company moves on. And lastly, during the cleanup phase of a storm, when the Company is clearing out single-outage tickets, the capability of interrogating individual meters can tell the Company when customers power has already been restored, saving a truck roll to confirm power has been restored.

Q. HAS THE COMPANY ASSESSED WHETHER THE DEPLOYMENT OF AMI TECHNOLOGY HAS RESULTED IN A POSITIVE IMPACT ON ITS COSTS?

A. Yes, the Company has estimated costs it otherwise would have incurred but for the deployment of AMI for calendar years 2016 and 2017. Deployment of AMI has enabled the Company to fulfill customer orders for connection, disconnection, and reconnection remotely rather than by conducting field visits. The Company estimates the costs it avoided due to remote customer order fulfillment were approximately $167,000 in 2016 and $540,000 in 2017. The Company has also estimated operational savings in costs it otherwise would have incurred for monthly meter reading. Deployment of AMI

technology now enables the Company to read meters remotely, reducing manual and drive-by meter reading costs. The Company estimates the costs it avoided due to the ability to read meters remotely each month were approximately $273,000 in 2016 and $524,000 in 2017.

Q. PLEASE DESCRIBE THE NEW CUSTOMER PROGRAMS ENABLED BY AMI.

A. There are three new customer programs now available to DE Carolinas customers with AMI. Pick Your Due Date allows eligible customers to select their desired billing due date from the 1st to the 31st of the month, better aligning with customer's needs. Usage Alerts provides eligible customers with an alert at the midpoint of their billing cycle showing their accumulated charges and forecast of their month-end bill. Usage Alert customers can customize their experience by choosing to receive threshold alerts that notify them when their charges are approaching or exceeding their monthly budget, allowing customers the opportunity to adjust their energy consumption before the end of a billing cycle. Usage Alert customers can further set and change their alert preferences in the Usage Alert Dashboard and set a budgeted dollar amount and change their alert channel to text message.

The third program is the Prepaid Advantage ("Prepaid Advantage") Pilot program (the "Pilot"), which the Commission initially approved in Docket No. 2015-136-E on May 12, 2015 and for which it granted extensions on June 21, 2017, December 20, 2017 and June 7, 2018. Prepaid Advantage

allows eligible customers greater payment flexibility, allowing frequent cash payments which may help customers better manage their finances. Prepaid Advantage does not require a deposit fee, allowing customers to use funds to which they otherwise would not have access. Additionally, if a Prepaid Advantage customer is disconnected for a negative balance, no reconnection fee is charged. Prepaid Advantage is designed to give customers the control and flexibility to make payments to their account before using electricity. Customers are able to view usage and account balance information via the Prepaid Advantage Customer Portal (using desktop computer or smart phone), and receive alerts through text messages, e-mail, or automated voice, at their discretion. Customers are able to use this information to recognize higher than usual electricity consumption on a daily basis, thereby better understanding what drives their costs.

IV. PREPAID ADVANTAGE PROGRAM

Q. WAS THE PREPAID ADVANTAGE PILOT PROGRAM A SUCCESS FROM THE COMPANY'S PERSPECTIVE?

A. Yes. The Pilot has been a success. To inform future offerings, Duke Energy sought to achieve the following milestones with the Pilot: 1) validate that the Prepaid Advantage technology and data exchanges work as designed and meet the needs of customers; 2) measure and track participant data, behavior and satisfaction to evaluate the need and feasibility to expand the Program; and 3) test the Program's overall ability to give customers the choice, control, and

flexibility to pay, in real time, for electricity. The Company successfully achieved these milestones and shared its findings with the Commission in its PrePaid Advantage SC Learnings Report filed on August 21, 2017 in Docket No. 2015-136-E. Currently, over 3,000 customers are enrolled in the Pilot and Duke Energy continues to receive positive customer feedback.

Q. IS THE COMPANY SEEKING TO REMOVE PREPAID ADVANTAGE FROM PILOT STATUS AND MAKE IT AN OFFERING TO ALL ELIGIBLE CUSTOMERS?

A. Yes. In this proceeding, the Company has proposed to open Prepaid Advantage as of June 1, 2019 for all eligible customers, remove it from pilot status, remove the customer cap and make the program available to customers across its entire DE Carolinas jurisdiction. The proposed tariff is discussed and attached as an exhibit to Witness Wheeler's testimony. Once Prepaid Advantage has been commercialized, the Company plans to market it to eligible customers through direct mail, other direct channels, as well as through Customer Care Operations. Eligible residential customers must make an initial payment of at least $40 and may not have a past due balance in excess of $500. No credit check or deposit is required while a customer is a program participant, and there are no minimum payment requirements once the initial deposit amount is met. However, should the customer exit the program and return to a traditional billing schedule, a deposit may again be required. The Company will allow customers with outstanding balances

below the maximum to participate and will apportion 25 percent of a given payment amount to outstanding balances, and 75 percent to fund ongoing usage.

Based on the amount of electricity used by customers, their Prepaid Advantage balance decreases from the amount paid. The dollar amount used will be calculated based on a daily meter reading. At the end of the monthly billing cycle, there will be a once-a-month true-up to reconcile the amount applied toward usage and the bill amount. This true-up ensures that customers neither underpay nor overpay for the cost of energy used under the applicable rate schedule which is designed on a monthly, rather than daily, basis. The amount of any adjustment will be shown on the Prepaid Advantage usage statement on the Prepaid Advantage Customer Portal. Customers may continue to pay through available channels at any frequency and amount they choose.

If the Commission approves the Company's request to establish a fee-free credit/debit card program for residential customers, as described in the pre-filed direct testimony of Witnesses Ghartey-Tagoe and Smith, all credit/debit card payment fees for eligible residential customers enrolling in Prepaid Advantage will be waived. Alternatively, if the Commission does not approve the Company's request to establish a fee-free credit/debit card program, the Company will waive only the first credit card fee per month for residential customers on PrePaid Advantage.

Customers will receive alerts, including payment confirmations, current account balance, estimated days of power remaining and disconnect notices, among other communications. These alerts will be sent through the channels the customer has indicated a preference for, including text message, e-mail, and/or automated outbound calls. The Company will require a minimum number of alerts of a declining account balance, when the customer has five, three and one day remaining, for example. The customer may also view all of this information in the Prepaid Advantage Customer Portal.

Customers will have access to the Prepaid Advantage Customer Portal where they can access information, such as their energy usage and choose on-going communications preferences. Specifically, they will have access to:

- Reports (view account balance, meter read and status, notification status, usage statement)
- Usage (view consumption and dollars remaining)
- Notifications (choose channels, times, frequency, etc.)
- Payments (select and pay by bank account, credit card, check, etc.)
- Autopay (opt-in for auto-refill account balance when estimated 2 days remaining)
- Balance information (view account balance, meter #)
- Support information (contacts)
- Usage at a glance (deferred balance, average daily consumption, past payment)

- Meter status (connected, disconnected)
- Usage info (statement snapshot, recent usage)

Q. DOES THE COMPANY ANTICIPATE SAVINGS TO CUSTOMERS DUE TO THE COMMERCIALIZATION OF PREPAID ADVANTAGE?

A. Yes. The Company anticipates certain cost savings for customers around deposit fees, usage reduction and reconnect fees. For example, 22 percent of start service traditional billing customers are assessed an average one-time deposit of $208, based on their financial history. A Prepaid customer, however, is not assessed a deposit when starting service with Duke Energy.

Moreover, a Prepaid customer reduces their usage on average by five to ten percent, compared to before they had enrolled in the Program. This correlates almost directly to a five to ten percent reduction in the customer's monthly bill. Furthermore, if a traditional billing customer experiences a disconnect, they would incur a $15 reconnect fee. On Prepaid Advantage, no reconnect fee is assessed. To date, Prepaid Advantage customers have benefited from 10,581 free reconnects, which translates to customer savings of approximately $158,715.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.